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Calbag

State of Oregon
# Department of Environmental Quality

# Memorandum

Date: August 25, 2011

**To:** Calbag Metals Facility
2500 NW Nicolai Street
ECSI# 5238

**From:** Jim Orr, Northwest Cleanup Section

**Subject:** No Further Action Recommendation

**Purpose**

The Oregon Department of Environmental Quality (DEQ) has completed a review of the document titled *Independent Cleanup Pathway Final Report (ICP Report)*, dated November 2010 and submitted to DEQ on the behalf of the Shaker Square LLC for the property located at 2500 NW Nicolai Street in Portland. The samples submitted for this investigation were a subset of samples collected as part of the investigations of separate properties located at 2495 and 2500 NW Nicolai Street sites. The Calbag site at 2495 NW Nicolai Street will be evaluated under DEQ's Voluntary Cleanup Program at a later date.

Shaker Square, LLC submitted this project under DEQ's Independent Cleanup Pathway Program and requested a No Further Action (NFA). DEQ was only provided with a limited amount of sampling data for the site. However, given the known site history, and that there were no significant impacts exhibited by the collected soil and groundwater data, DEQ did not see the need for additional data collection. The report and data from supporting investigations for only the site at 2500 NW Nicolai Street was reviewed by DEQ under an Independent Cleanup Pathway agreement dated August 14, 2009.

This ICP Report provides the basis for DEQ's proposed conditional NFA recommendation for the Calbag Metals Facility (Site) located 2500 NW Nicolai Street, Portland. The property consists of Tax Lots 1 through 6, Block 3 of the Versteegs Addition, in Multnomah County, Oregon. DEQ's NFA recommendation is proposed following the completing of a risk-based evaluation of site contamination in accordance with DEQ's *Risk-Based Decision Making for the Remediation of Petroleum-Contaminated Sites* guidance (September 2003, with screening table last updated September 2009) under Oregon Administrative Rules (OAR) Chapter 340, Division 122, Sections 0205 to 0360. This recommended action also was selected in accordance with Oregon Revised Statutes (ORS) 465.200 through 465.455 and OAR Chapter 340, Division 122, Sections 010 to 0140.

**Site Layout and Operating History**

The Site is located in an industrialized portion of northwest Portland, approximately ½ mile southwest of the Willamette River. Historical Sanborn Maps indicate that the building was constructed on undeveloped land in 1949 and was described as a "Junk Warehouse". Calbag Metals Company purchased the site in 1960 and has operated a nonferrous scrap metal facility to the present day. Calbag purchases, sorts, and packages nonferrous scrap metal for resale. No fabrication is performed onsite and all activities are performed inside the warehouse on paved surfaces. The 0.9-acre Site consists of an approximately 30,000-square foot building constructed of wood and concrete, while areas outside of the building are used for parking and loading docks. There are no catch basins on site which connect to

local storm sewers, and surface drainage ultimately discharges to offsite catch basins and then to the Willamette River. No sumps or like features are known to be present within the site building.

**Geology and Hydrogeology**

The site and surrounding area are located on a geomorphic terrace situated along the western margin of the Willamette River. The terrace is formed by Quaternary sedimentary flood deposits and Pleistocene fine-grained geologic units of coarse sand to silt. The Site is directly underlain mainly by Pleistocene flood deposits with a thin veneer of artificial fill at the ground surface. Investigations at the Site encountered approximately 1 foot of fill, overlying clayey silt to about 12 feet, and silty sand with lenses of gravel to 55 feet below ground surface (bgs).

Site elevations are approximately 65 to 68 feet above mean sea level (MSL), with land sloping to the northeast. The Willamette River is the closest surface water body, located approximately ½ mile to the northeast. Three site monitoring wells measured shallow ground water at depths ranging from 47-52 feet bgs. The estimated groundwater flow direction, based on monitoring well measurements, is to the north-northwest, towards the Willamette River.

**Environmental Investigations**

The ICP Report cited the May 2009 Environmental Site Assessment which included boring and monitoring well installations. ICP Report Figures 1 through 6 provides locations for site investigation activities. Tables 2 and 3 provide analytical results of soil and groundwater sampling completed at the site between 2008 and 2010. Tables 4 and 5 provide soil and groundwater maximum detected chemicals compared to relevant Risk Based Concentrations (DEQ RBCs).

Three soil borings (B-7, B-8, and B-9) and three monitoring wells (MW-4, MW-5, and MW-6) were installed in 2008 and 2009. MW-5 was installed in boring B-8 and MW-6 was installed in boring B-9. B-9/MW-6 and B-7 are located within the site building, and were apparently located to assess potential impacts from ongoing scrap operations within the building. MW-4 and B-8/MW-5 are located outside (immediately east) of the building, near the eastern site boundary. Soil samples were collected during boring installation and groundwater sampling was performed in November 2008, February 2009, and March 2010. The contaminants of interest (COIs) for surface soil, subsurface soil, and groundwater include petroleum hydrocarbons, polycyclic aromatic hydrocarbons (PAHs), polychlorinated biphenyls (PCBs), volatile organic compounds (VOCs), metals, and pesticides. Soil investigation consisted of the advancement of four soil borings to a maximum depth of 60-feet bgs at the site, and collection of twelve soil samples as indicated on Table 3 for analysis. The groundwater investigation consisted of sampling of the three site wells on two occasions and is presented in Tables 2, 3, and 5.

As shown on Table 4, no analytical soil results for COIs exceeded screening levels for relevant receptors (occupational workers) with the exception of soil sample B7-S-3 collected from below the site building floor. Analytical results from soil sample B7-S-3, collected from three feet bgs, modestly exceeded benzo[a]pyrene and dibenz[a,h]anthracene risk-based concentration (RBC) levels for the occupational worker pathway. The elevated levels of PAHs in this soil sample are suspected to be from historical operations.

No analytical groundwater results exceeded relevant human health screening levels. Groundwater sample analysis included the following constituents: petroleum hydrocarbons, PAHs, PCBs, VOCs, metals, and pesticides. Groundwater concentrations were also compared with ecological screening level values (SLVs) even though a complete pathway to surface water is not expected to exist due to the

low level of total metal exceedences and distance of approximately 1/2 mile from the Willamette River. SLVs were exceeded for total metals chromium, copper, lead, and zinc. Dissolved metals analysis concentrations did not exceed SLVs.

***Conceptual Site Model and Beneficial Land Use Determination***

A Conceptual Site Model (CSM) for the site was developed, based in part on evaluations of beneficial land use and beneficial water use. The current and likely future land use for the Site is expected to be consistent with the current zoning designation of heavy industrial use. Beneficial water use is limited to industrial use within the Locality of Facility (LOF). The LOF is considered to be the site boundary based on the results of soil and ground water analytical results that showed no contamination impact beyond the site boundary. There is no use of groundwater for drinking or other purposes in the immediate site vicinity (within ¼ mile radius). The primary identified "beneficial use" of groundwater outside the LOF is recharge of Willamette River and limited industrial use. As the site is almost completed paved, there is no significant ecological habitat.

The following are the identified current and potential future human receptors and exposure pathways for the site:

*Occupational worker* – Incidental ingestion, dermal, and inhalation exposure to soil. Indoor and outdoor vapor transport from groundwater.

*Construction worker* - Incidental ingestion, dermal, and inhalation exposure to soil. Dermal and inhalation exposure to groundwater.

*Excavation worker* - Incidental ingestion, dermal, and inhalation exposure to soil. Dermal and inhalation exposure to groundwater.

**Risk Assessment**

A risk assessment evaluation was completed based on the findings of the reports discussed above and conclusions summarized as follows:

- The LOF is identified as the site property boundary for soil contamination and potential groundwater plume impacts. DEQ agreed with this determination because outside of PAHs detections at a single location, no significant soil or ground water impacts were observed at the site. A Level 1 Ecological Risk Assessment (ERA) was performed in accordance with DEQ's 1998 guidance. The assessment did not indicate the presence of on-site ecologically important species or habitat within the LOF.

- A beneficial water use determination was performed, which concluded that there is little potential for current use of shallow site groundwater for human consumption within the LOF due to availability of public water supplies. Water uses include industrial ground water wells, and recharge of Willamette River and are found greater than ¼ mile radius from the Site.

- The CSM identified the site and adjacent properties to be zoned industrial. Land use for the area is expected to remain the same in the future. The CSM identified the following exposure pathways: current or future occupational worker exposure to soil and vapors from groundwater, and construction/excavation worker exposure to soil and groundwater.

- Low levels of COIs were detected in some surface/subsurface soils and shallow groundwater at the Site. COIs detected in ground water included VOCs and metals. PAHS were not detected in ground water above detection limits. Total metals were detected in one ground water sample exceeding ecological SLVs but dissolved metals detections were below SLVS. Low levels of VOCs

were also detected in water samples that were below RBCs and SLVs. COIs detected in soil include arsenic, barium, chromium, lead, and PAHs. Only PAHs exceeded relevant screening levels: analytical results from one soil sample (B7-S-3) from three feet bgs exceeded two PAH RBCs by a factor of two for the occupational worker pathway (Table 4). PAH concentrations at the other three soil sample locations were either non-detect or just above the detection limit. Given the small number of soil samples collected, an exposure point concentration using an upper confidence limit on the arithmetic mean concentration for the site-wide exposure unit cannot be calculated. The elevated levels of PAHs in soil are suspected to be from historical operations. Current exposure to PAHs in surficial soils is limited due to extensive paving, small area of soil impact, and limited mobility to ground water.

**Conclusions and Recommendations**

The Calbag Metals Site at 2500 NW Nicolai Street has not performed a Source Control Evaluation (SCE). Given that surface drainage on-site ultimately discharge to the Willamette River and as a site located within the Portland Harbor Superfund study area basin, a SCE will need to be completed for the site. DEQ has requested additional information regarding site stormwater drainage and will determine what level of SCE is needed.

With one exception, contaminant concentrations detected in soils and groundwater are below relevant risk criteria. The one exceedance represents only a modest exceedance of DEQ RBCs, and is present below the site building. Given the exceedance, and the acknowledgement by DEQ that the amount of soil sampling completed at the site is limited, DEQ recommends that any future ground-disturbing work on the site should include soil screening, testing, and proper management to protect site workers and determine appropriate management for any soil that might be removed from the site.

Significant groundwater impacts were not observed at the site, and the beneficial water use determination did not identify any use of shallow groundwater in the shallow ground water is not currently used and future use is unlikely due to existing zoning and city water availability. The current and future use of ground water as a drinking water source is unlikely. Groundwater therefore does not appear to be a significant concern at the site. It is noted by DEQ that groundwater wells at the site are located along the site eastern margin. Given the surmised groundwater flow direction to the north, these are not ideally located for monitoring potential impacts to groundwater from site-related activities. Given the sum of information regarding the site, they are nevertheless considered sufficient.

Based on the above information, DEQ concludes that no further action is required to address environmental contamination at the Site .

**References**

*Independent Cleanup Pathway Final Report*, November 2010, GeoPro LLC
*Environmental Site Assessment Subsurface,* May 2009, GeoPro LLC

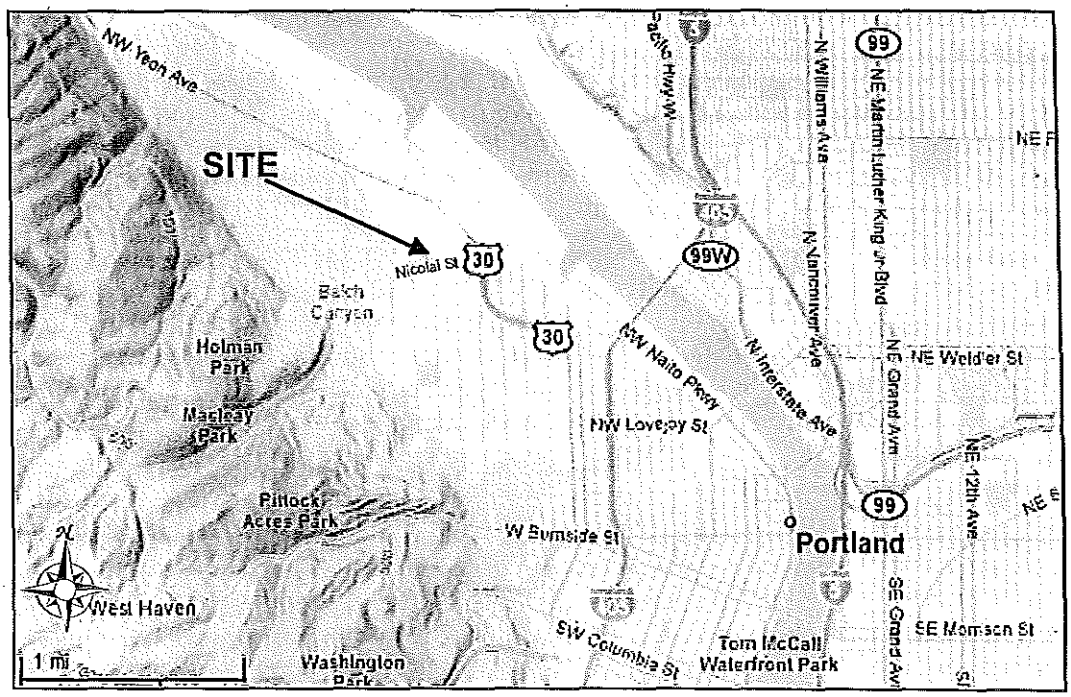



**Figure 1 – Location Map, Portland, Oregon**

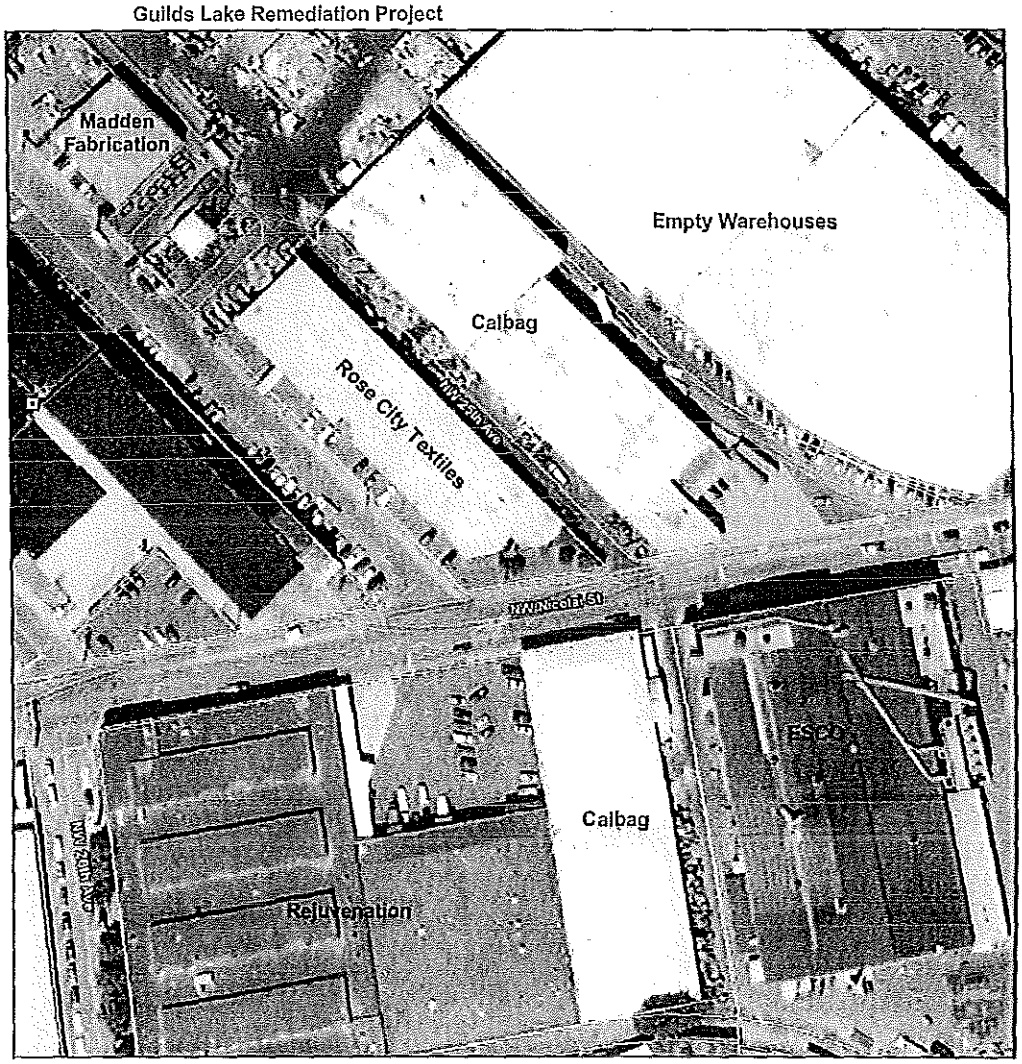
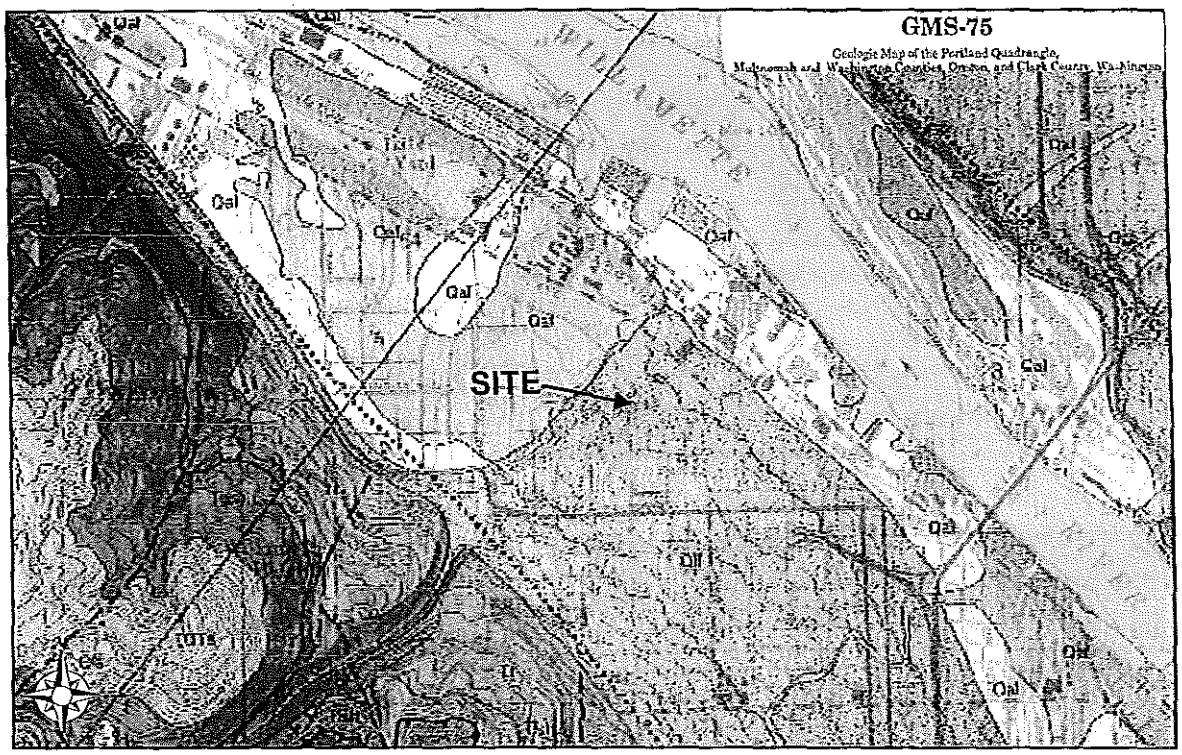



Figure 2 – Adjacent Properties, NW Nicolai St., Portland, Oregon




Legend

Qal — **Artificial fill (Holocene)** — Sand, silt, and clay fills with subordinate amounts of gravel, debris, and local concentrations of sawdust and mill ends. Unit Qaf is mapped only where fill has eliminated lakes, sloughs, marshes, or gullies delineated during 1893 survey for earliest topographic map of Portland (U.S. Geological Survey, 1905). Fill areas mapped with queried contacts represent lakes and marshes that may have been drained rather than filled. Fill 1.5 to 5 m thick is common in developed areas of Columbia and Willamette floodplains, but thickness and distribution are highly variable, and it is not depicted on this map

Qal — **Alluvium (Quaternary)** — River and stream deposits of silt, sand, and organic-rich clay with subordinate gravel of mixed lithologies; largely confined to Columbia and Willamette River channels and valley bottoms of tributary streams; may include local lacustrine, paludal, and eolian deposits. Unit Qal reaches maximum thickness of 45 m

Qff — **Fine-grained facies (Pleistocene)** — Coarse sand to silt deposited by catastrophic floods. Silt and fine sand composed predominantly of quartz and feldspar with white mica. Coarser sand composed predominantly of Columbia River basalt. Poorly defined beds of 30-cm to 1-m thickness are observed in outcrop. Locally, beds are separated by accumulations of clay and iron oxide 1 to 6 cm thick, which may be paleosols. Modern soil development commonly introduces abundant clay and iron oxides into upper 2 to 3 m of deposits. Fine sediments are locally thick in lower elevations of area and extend upslope as mantle to elevations between 90 and 105 m. Unit Qff reaches maximum thickness of 30 to 40 m. Unit Qff is equivalent to Willamette Silt of Allison (1953) and includes lacustrine sand, lacustrine silt and clay, and sand and silt deposits of Trimble (1963)

## Figure 3 – Geology Map, Northwest Portland, Oregon

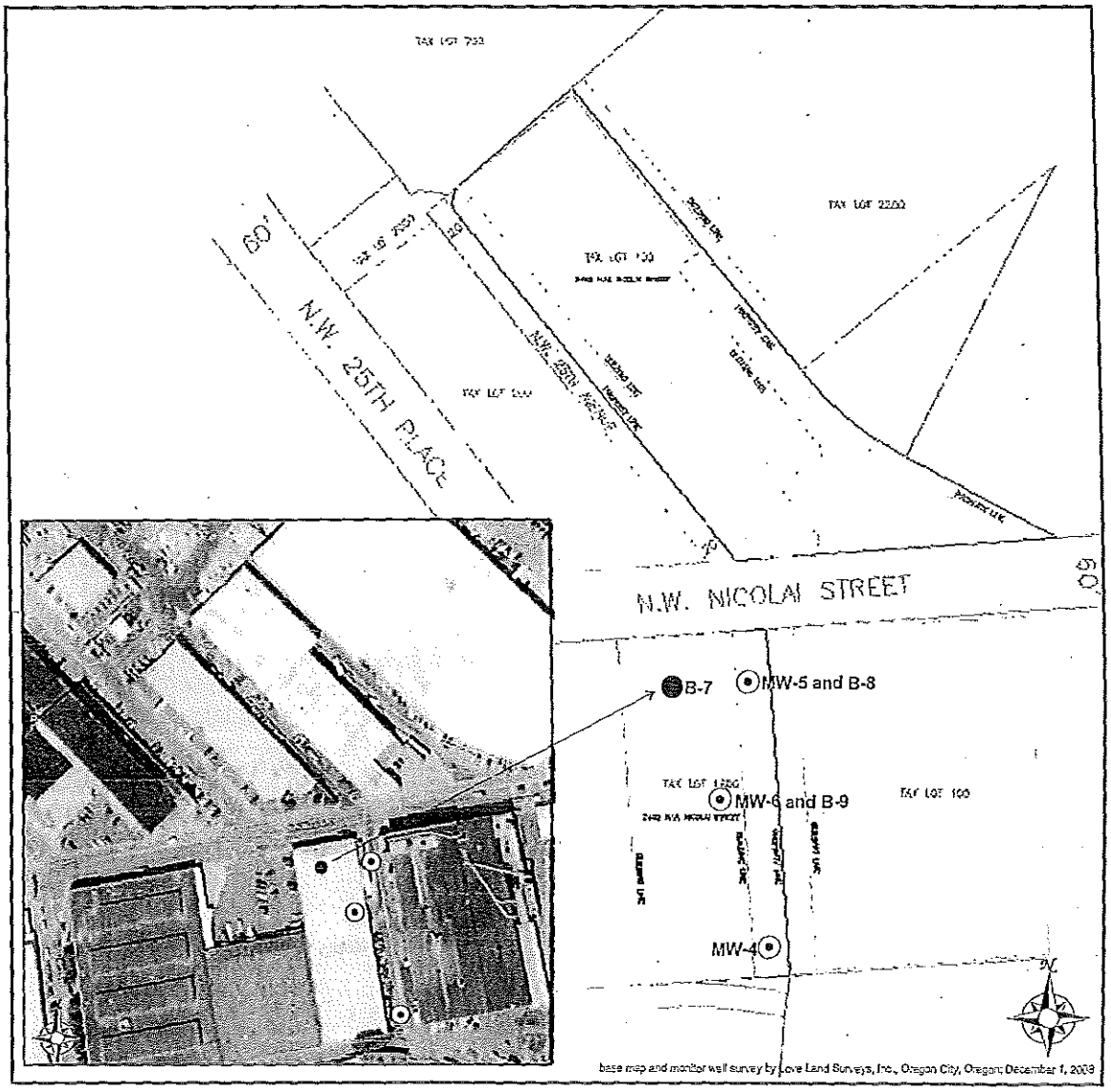



**Figure 4 – Monitoring Well Locations**

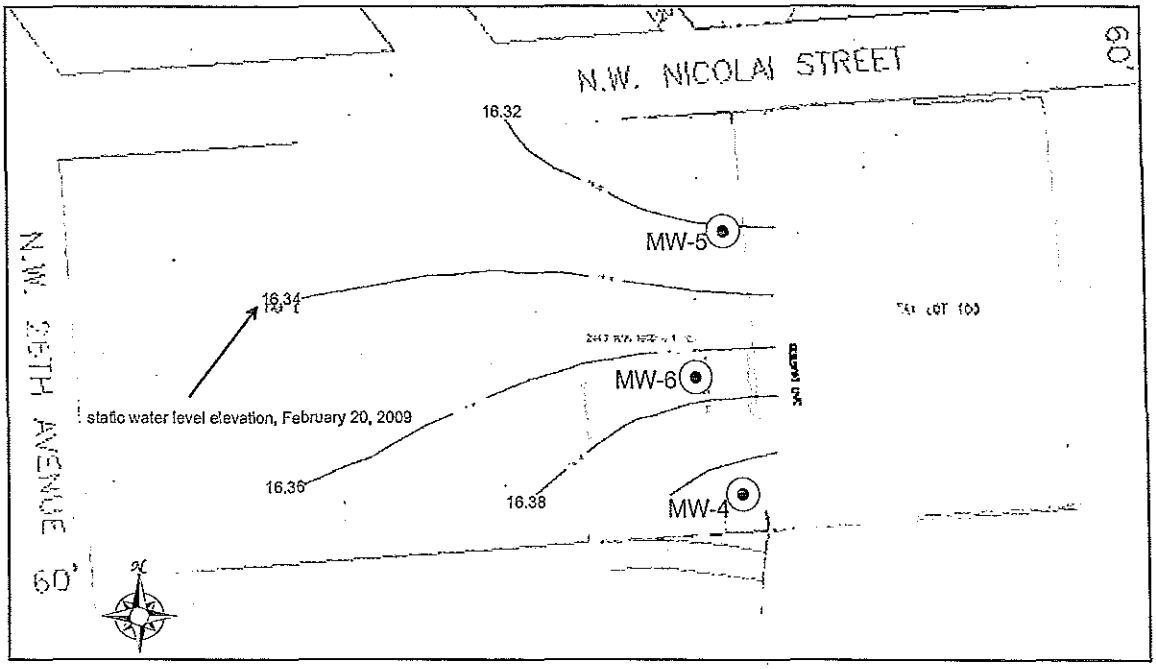



Figure 5 – Groundwater Flow Direction, February 20, 2009

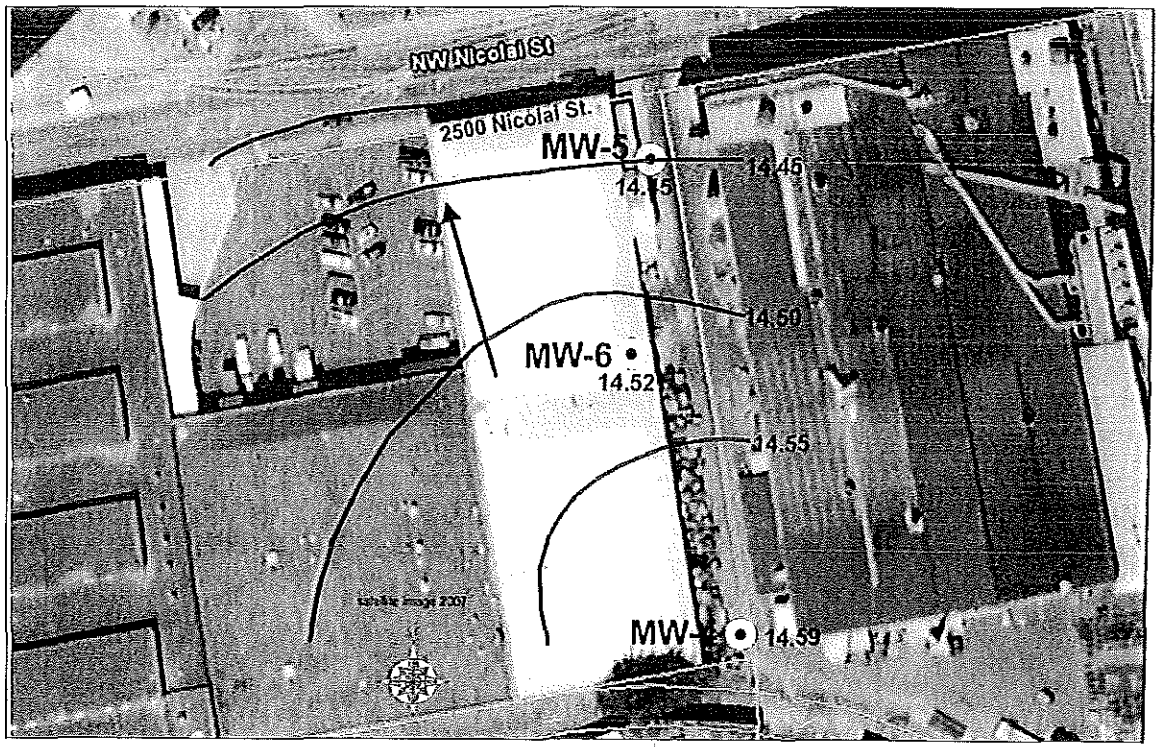



Figure 6 – Groundwater Flow Direction, March 22 and 30, 2010

## Table 2 - Groundwater Analyses Monitor Wells

| | | MW-4 (45-55) ug/l[2] | | MW-5 (40-50) ug/l | | MW-6 (45-55) ug/l | |
|---|---|---|---|---|---|---|---|
| CHEMICALS | DEQ SLV[1] ug/l | 11/10/08[3] | 3/30/10[3] | 2/20/09[3] | 3/22/10[3] | 2/20/09[3] | 3/22/10[3] |
| METALS-TOTAL (EPA 6010B/7471A) | | | | | | | |
| Antimony | 1600 | <5.6 | <5.6 | <5.6 | <5.6 | <5.6 | <5.6 |
| Arsenic | 150 | <3.3 | 6.2 | <3.3 | <3.3 | <3.3 | <3.3 |
| Beryllium | 5.3 | <11 | <11 | <11 | <11 | <11 | <11 |
| Cadmium | 2.2 | <4.4 | <4.4 | <4.4 | <4.4 | <4.4 | <4.4 |
| Chromium (VI) | 11 | <11 | 24 | <11 | <11 | <11 | <11 |
| Copper | 9 | <11 | 28 | <11 | <11 | <11 | <11 |
| Lead | 2.5 | <1.1 | 9.7 | <1.1 | <1.1 | <1.1 | <1.1 |
| Mercury | 0.77 | <0.5 | <0.5 | <0.5 | <0.5 | <0.5 | <0.5 |
| Nickel | 52 | <22 | 25 | <22 | <22 | <22 | <22 |
| Selenium | 5 | <5.6 | <5.6 | <5.6 | <5.6 | <5.6 | <5.6 |
| Silver | 0.12 | <11 | <11 | <11 | <11 | <11 | <11 |
| Thallium | 40 | <5.6 | <5.6 | <5.6 | <5.6 | <5.6 | <5.6 |
| Zinc | 120 | <28 | 160 | <28 | <56 | <28 | <56 |
| | | | | | | | |
| METALS-DISSOLVED (EPA 200.8/7470A) | | | | | | | |
| Antimony | 1600 | <5 | | <5 | | <5 | |
| Arsenic | 150 | <3 | | <3 | | <3 | |
| Beryllium | 5.3 | <10 | | <10 | | <10 | |
| Cadmium | 2.2 | <4 | | <4 | | <4 | |
| Chromium (total) | 11 | <10 | | <10 | | <10 | |
| Copper | 9 | <10 | | <10 | | <10 | |

| | | MW-4 (45-55) ug/l[2] | | MW-5 (40-50) ug/l | | MW-6 (45-55) ug/l | |
|---|---|---|---|---|---|---|---|
| CHEMICALS | DEQ SLV[1] ug/l | 11/10/08[3] | 3/30/10[3] | 2/20/09[3] | 3/22/10[3] | 2/20/09[3] | 3/22/10[3] |
| Lead | 2.5 | <1 | | <1 | | <1 | |
| Mercury | 0.77 | <0.5 | | <0.5 | | <0.5 | |
| Nickel | 52 | <20 | | <20 | | <20 | |
| Selenium | 5 | <5 | | <5 | | <5 | |
| Silver | 0.12 | <10 | | <10 | | <10 | |
| Thallium | 40 | <5 | | <5 | | <5 | |
| Zinc | 120 | <50 | | <50 | | <50 | |
| | | | | | | | |
| PCBs AROCLORS (EPA 8082) | | | | | | | |
| Aroclor 1016 | | <0.047 | <0.047 | <0.047 | <0.047 | <0.047 | <0.047 |
| Aroclor 1221 | 0.28 | <0.047 | <0.047 | <0.047 | <0.047 | <0.047 | <0.047 |
| Aroclor 1232 | 0.58 | <0.047 | <0.047 | <0.047 | <0.047 | <0.047 | <0.047 |
| Aroclor 1242 | 0.053 | <0.047 | <0.047 | <0.047 | <0.047 | <0.047 | <0.047 |
| Aroclor 1248 | 0.081 | <0.047 | <0.047 | <0.047 | <0.047 | <0.047 | <0.047 |
| Aroclor 1254 | 0.033 | <0.047 | <0.047 | <0.047 | <0.047 | <0.047 | <0.047 |
| Aroclor 1260 | 94 | <0.047 | <0.047 | <0.047 | <0.047 | <0.047 | <0.047 |
| | | | | | | | |
| ORGANOCHLORINE PESTICIDES (EPA 8081A) | | | | | | | |
| alpha-BHC | 2.2 | <0.0047 | | <0.0047 | | <0.0047 | |
| beta-BHC | 2.2 | <0.0047 | | <0.0047 | | <0.0047 | |
| delta-BHC | | <0.0047 | | <0.0047 | | <0.0047 | |
| gamma-BHC (Lindane) | 0.052 | <0.0047 | | <0.0047 | | <0.0047 | |
| Heptachlor | 0.08 | <0.0047 | | <0.0047 | | <0.0047 | |
| Aldrin | 0.06 | <0.0047 | | <0.0047 | | <0.0047 | |
| Heptachlor Expoxide | 0.0038 | <0.0047 | | <0.0047 | | <0.0047 | |
| gamma-Chlordane | 0.0043 | <0.0047 | | <0.0047 | | <0.0047 | |

| | | MW-4 (45-55) ug/l[2] | | MW-5 (40-50) ug/l | | MW-6 (45-55) ug/l | |
|---|---|---|---|---|---|---|---|
| CHEMICALS | DEQ SLV[1] ug/l | 11/10/08[3] | 3/30/10[3] | 2/20/09[3] | 3/22/10[3] | 2/20/09[3] | 3/22/10[3] |
| alpha-Chlordane | 0.0043 | <0.0047 | | <0.0047 | | <0.0047 | |
| 4,4'-DDE | | <0.0047 | | <0.0047 | | <0.0047 | |
| 4,4'-DDD | 0.001 | <0.0047 | | <0.0047 | | <0.0047 | |
| 4,4'-DDT | 0.001 | <0.0047 | | <0.0047 | | <0.0047 | |
| Dieldrin | 0.056 | <0.0047 | | <0.0047 | | <0.0047 | |
| Endosulfan I | 0.056 | <0.0047 | | <0.0047 | | <0.0047 | |
| Endosulfan II | 0.056 | <0.0047 | | <0.0047 | | <0.0047 | |
| Endrin | 0.036 | <0.0047 | | <0.0047 | | <0.0047 | |
| Endrin Aldehyde | | <0.0047 | | <0.0047 | | <0.0047 | |
| Methoxychlor | 0.03 | <0.0094 | | <0.0094 | | <0.0094 | |
| Endosulfan Sulfate | | <0.0047 | | <0.0047 | | <0.0047 | |
| Endrin Ketone | | <0.019 | | <0.019 | | <0.019 | |
| Toxaphene | 0.0002 | <0.047 | | <0.047 | | <0.047 | |
| | | | | | | | |
| VOLATILE ORGANIC CHEMICALS (EPA 8260B) | | | | | | | |
| 1,1,1,2-Tetrachloroethane | 186 | <0.2 | <0.2 | <0.2 | <0.2 | <0.2 | <0.2 |
| 1,1,1-Trichloroethane | 11 | <0.2 | <0.2 | <0.2 | <0.2 | <0.2 | <0.2 |
| 1,1,2,2-Tetrachoroethane | 2200 | <0.2 | <0.2 | <0.2 | <0.2 | <0.2 | <0.2 |
| 1,1,2-Trichoroethane | 9400 | <0.2 | <0.2 | <0.2 | <0.2 | <0.2 | <0.2 |
| 1,1-Dichloroethane | 47 | <0.2 | <0.2 | <0.2 | <0.2 | <0.2 | <0.2 |
| 1,1-Dichloroethene | 25 | <0.2 | <0.2 | <0.2 | <0.2 | <0.2 | <0.2 |
| 1,1-Dichloropropene | | <0.2 | <0.2 | <0.2 | <0.2 | <0.2 | <0.2 |
| 1,2,3-Trichlorobenzene | | <0.2 | <0.2 | <0.2 | <0.2 | <0.2 | <0.2 |
| 1,2,3-Trichloropropane | | <0.2 | <0.2 | <0.2 | <0.2 | <0.2 | <0.2 |
| 1,2,4-Trichlorobenzene | 110 | <0.2 | <0.2 | <0.2 | <0.2 | <0.2 | <0.2 |
| 1,2,4-Trimethylbenzene | | <0.2 | <0.2 | <0.2 | <0.2 | <0.2 | <0.2 |

| | | MW-4 (45-55) ug/l[2] | | MW-5 (40-50) ug/l | | MW-6 (45-55) ug/l | |
|---|---|---|---|---|---|---|---|
| CHEMICALS | DEQ SLV[1] ug/l | 11/10/08[3] | 3/30/10[3] | 2/20/09[3] | 3/22/10[3] | 2/20/09[3] | 3/22/10[3] |
| 1,2-Dibromo-3-chloropropane | | <1 | <1 | <1 | <1 | <1 | <1 |
| 1,2-Dibromoethane | | <0.2 | <0.2 | <0.2 | <0.2 | <0.2 | <0.2 |
| 1,2-Dichlorobenzene | 14 | <0.2 | <0.2 | <0.2 | <0.2 | <0.2 | <0.2 |
| 1,2-Dichloroethane | 20000 | <0.2 | <0.2 | <0.2 | <0.2 | <0.2 | <0.2 |
| 1,2-Dichloropropane | 5700 | <0.2 | <0.2 | <0.2 | <0.2 | <0.2 | <0.2 |
| 1,3,5-Trimethylbenzene | | <0.2 | <0.2 | <0.2 | <0.2 | <0.2 | <0.2 |
| 1,3-Dichlorobenzene | 71 | <0.2 | <0.2 | <0.2 | <0.2 | <0.2 | <0.2 |
| 1,3-Dichloropropane | | <0.2 | <0.2 | <0.2 | <0.2 | <0.2 | <0.2 |
| 1,4-Dichlorobenzene | 15 | <0.2 | <0.2 | <0.2 | <0.2 | <0.2 | <0.2 |
| 2,2-Dichloropropane | | <0.2 | <0.2 | <0.2 | <0.2 | <0.2 | <0.2 |
| 2-Butanone (Methyl Ethyl Ketone) | | <5 | <5 | <5 | <5 | <5 | <5 |
| 2-Chloroethyl Vinyl Ether | 4760 | <1 | <1 | <1 | <1 | <1 | <1 |
| 2-Chlorotoluene | | <0.2 | <0.2 | <0.2 | <0.2 | <0.2 | <0.2 |
| 2-Hexanone | 99 | <2 | <2 | <2 | <2 | <2 | <2 |
| 4-Chlorotoluene | | <0.2 | <0.2 | <0.2 | <0.2 | <0.2 | <0.2 |
| Acetone | 1500 | <5 | <5 | <5 | <5 | <5 | <5 |
| Benzene | 130 | <0.2 | <0.2 | <0.2 | <0.2 | <0.2 | <0.2 |
| Bromobenzene | | <0.2 | <0.2 | <0.2 | <0.2 | <0.2 | <0.2 |
| Bromochloromethane | | <0.2 | <0.2 | <0.2 | <0.2 | <0.2 | <0.2 |
| Bromodichloromethane | | <0.2 | <0.2 | <0.2 | <0.2 | <0.2 | <0.2 |
| Bromoform | | <1 | <1 | <1 | <1 | <1 | <1 |
| Bromomethane | | <0.2 | <0.2 | <0.2 | <0.2 | <0.2 | <0.2 |
| Carbon Disulfide | 0.92 | <0.2 | <0.2 | <0.2 | <0.2 | <0.2 | <0.2 |
| Carbon Tetrachloride | 74 | <0.2 | <0.2 | <0.2 | <0.2 | 0.35 | <0.2 |
| Chlorethane | | <1 | <1 | <1 | <1 | <1 | <1 |
| Chlorobenzene | 50 | <0.2 | <0.2 | <0.2 | <0.2 | <0.2 | <0.2 |

| | | MW-4 (45-55) ug/l[2] | | MW-5 (40-50) ug/l | | MW-6 (45-55) ug/l | |
|---|---|---|---|---|---|---|---|
| CHEMICALS | DEQ SLV[1] ug/l | 11/10/08[3] | 3/30/10[3] | 2/20/09[3] | 3/22/10[3] | 2/20/09[3] | 3/22/10[3] |
| Chloroform | 1240 | <0.2 | 1.2 | <0.2 | 3.2 | <0.2 | <0.2 |
| Chloromethane | | <1 | <1 | <1 | <1 | <1 | <1 |
| cis-1,2-Dichloroethylene | 590 | <0.2 | <0.2 | <0.2 | <0.2 | <0.2 | <0.2 |
| trans-1,2-Dichloroethene | 590 | <0.2 | <0.2 | <0.2 | <0.2 | <0.2 | <0.2 |
| cis-1,3-Dichloropropene | 244 | <0.2 | <0.2 | <0.2 | <0.2 | <0.2 | <0.2 |
| Dibromochloromethane | | <0.2 | <0.2 | <0.2 | <0.2 | <0.2 | <0.2 |
| Dibromomethane | | <0.2 | <0.2 | <0.2 | <0.2 | <0.2 | <0.2 |
| Dichlorodifluoromethane | | <0.2 | <0.2 | <0.2 | <0.2 | <0.2 | <0.2 |
| Ethylbenzene | 7.3 | <0.2 | <0.2 | <0.2 | <0.2 | <0.2 | <0.2 |
| Hexachlorobenzene | | | | | | | |
| Hexachlorobutadiene | 9.3 | <0.2 | <0.2 | <0.2 | <0.2 | <0.2 | <0.2 |
| Iodomethane (Methyl Iodide) | | <1 | <1 | <1 | <1 | <1 | <1 |
| Isopropylbenzene | | <0.2 | <0.2 | <0.2 | <0.2 | <0.2 | <0.2 |
| m,p-Xylene | 1.8 | <0.4 | <0.4 | <0.4 | <0.4 | <0.4 | <0.4 |
| Methylene Chloride | 2200 | <1 | <1 | <1 | <1 | <1 | <1 |
| Methyt-Butyl Ether | | <0.2 | <0.2 | <0.2 | <0.2 | <0.2 | <0.2 |
| Methyl Isobutyl Ketone | | <2 | <2 | <2 | <2 | <2 | <2 |
| Naphthalene | 620 | <1 | <1 | <1 | <1 | <1 | <1 |
| n-Butylbenzene | | <0.2 | <0.2 | <0.2 | <0.2 | <0.2 | <0.2 |
| n-Propylbenzene | | <0.2 | <0.2 | <0.2 | <0.2 | <0.2 | <0.2 |
| o-Xylene | | <0.2 | <0.2 | <0.2 | <0.2 | <0.2 | 0.22 |
| p-Isopropyltoluene | | <0.2 | <0.2 | <0.2 | <0.2 | <0.2 | <0.2 |
| sec-Butylbenzene | | <0.2 | <0.2 | <0.2 | <0.2 | <0.2 | <0.2 |
| Styrene | | <0.2 | <0.2 | <0.2 | <0.2 | <0.2 | <0.2 |
| tert-Butylbenzene | | <0.2 | <0.2 | <0.2 | <0.2 | <0.2 | <0.2 |
| Tetrachloroethene | 840 | 0.3 | <0.2 | <0.2 | <0.2 | 0.21 | <0.2 |

| | | MW-4 (45-55) ug/l[2] | | MW-5 (40-50) ug/l | | MW-6 (45-55) ug/l | |
|---|---|---|---|---|---|---|---|
| CHEMICALS | DEQ SLV[1] ug/l | 11/10/08[3] | 3/30/10[3] | 2/20/09[3] | 3/22/10[3] | 2/20/09[3] | 3/22/10[3] |
| Toluene | 9.8 | <1 | <1 | <1 | <1 | <1 | <1 |
| trans-1,2-Dichloroethene | 590 | <0.2 | <0.2 | <0.2 | <0.2 | <0.2 | <0.2 |
| trans-1,3-Dichloropropene | 244 | <0.2 | <0.2 | <0.2 | <0.2 | <0.2 | <0.2 |
| Trichloroethene | 21900 | <0.2 | <0.2 | <0.2 | <0.2 | <0.2 | <0.2 |
| Trichlorofluoromethane | | <0.2 | <0.2 | <0.2 | <0.2 | <0.2 | <0.2 |
| Vinyl Acetate | 16 | <2 | <2 | <2 | <2 | <2 | <2 |
| Vinyl Chloride | | <0.2 | <0.2 | <0.2 | <0.2 | <0.2 | <0.2 |
| | | | | | | | |
| POLYCYCLIC AROMATIC HYDROCARBONS (EPA 8270D/SIM) | | | | | | | |
| Naphthalene | 620 | <0.095 | <0.095 | <0.095 | <0.094 | <0.094 | <0.094 |
| 2-Methylnaphthalene | | <0.095 | <0.095 | <0.095 | <0.094 | <0.094 | <0.094 |
| 1-Methylnaphthalene | 201 | <0.095 | <0.095 | <0.095 | <0.094 | <0.094 | <0.094 |
| Acenaphthylene | | <0.095 | <0.095 | <0.095 | <0.094 | <0.094 | <0.094 |
| Acenpththene | 520 | <0.095 | <0.095 | <0.095 | <0.094 | <0.094 | <0.094 |
| Fluorene | 3.9 | <0.095 | <0.095 | <0.095 | <0.094 | <0.094 | <0.094 |
| Phenanthrene | 6.3 | <0.095 | <0.095 | <0.095 | <0.094 | <0.094 | <0.094 |
| Anthracene | 13 | <0.095 | <0.095 | <0.095 | <0.094 | <0.094 | <0.094 |
| Fluoranthene | 6.16 | <0.095 | <0.095 | <0.095 | <0.094 | <0.094 | <0.094 |
| Pyrene | | <0.095 | <0.095 | <0.095 | <0.094 | <0.094 | <0.094 |
| Benzo(a)anthracene | 0.027 | <0.0095 | <0.0095 | <0.0095 | <0.0094 | <0.0094 | <0.0094 |
| Chrysene | | <0.0095 | <0.0095 | <0.0095 | <0.0094 | <0.0094 | <0.0094 |
| Benzo(b)fluoranthene | | <0.0095 | <0.0095 | <0.0095 | <0.0094 | <0.0094 | <0.0094 |
| Benzo(k)fluoranthene | | <0.0095 | <0.0095 | <0.0095 | <0.0094 | <0.0094 | <0.0094 |
| Benzo(a)pyrene | 0.014 | <0.0095 | <0.0095 | <0.0095 | <0.0094 | <0.0094 | <0.0094 |
| Ideno(1,2,3-c,d)pyrene | | <0.0095 | <0.0095 | <0.0095 | <0.0094 | <0.0094 | <0.0094 |

| | | MW-4 (45-55) ug/l[2] | | MW-5 (40-50) ug/l | | MW-6 (45-55) ug/l | |
|---|---|---|---|---|---|---|---|
| CHEMICALS | DEQ SLV[1] ug/l | 11/10/08[3] | 3/30/10[3] | 2/20/09[3] | 3/22/10[3] | 2/20/09[3] | 3/22/10[3] |
| Dibenz(a,h)anthracene | | <0.0095 | <0.0095 | <0.0095 | <0.0094 | <0.0094 | <0.0094 |
| Benzo(g,h,i)perylene | | <0.0095 | <0.0095 | <0.0095 | <0.0094 | <0.0094 | <0.0094 |
| | | | | | | | |
| PETROLEUM HYDROCARBONS | | | | | | | |
| Diesel Range (NWTPH-Dx) | | <250 | <250 | <250 | <250 | <250 | <250 |
| Lube Oil Range (NWTPH-Dx) | | <400 | <400 | <400 | <400 | <400 | <400 |
| Gasoline (NWTPH-Gx) | | <100 | <100 | <100 | <100 | <100 | <100 |
| Oil & Grease (EPA 1664) | | <5200 | | <5200 | | <5200 | |
| | | | | | | | |
| Total Organic Carbon | | | <1000 | | <1000 | | <1000 |

Notes:
*[1]Freshwater aquatic screening Level Values (SLVs) from DEQ Ecological Risk Assessment: Level I, II, III, IV, 1998. Blank cell means no criterion available.*
*[2]Monitoring well number, with screened interval in feet depth below ground surface and detected values in ug/l.*
*[3]Blank cells mean not analyzed.*
*Detected concentration below detection level (practical quantitation limit; PQL) noted as (<) with its respective PQL value. Bolded values are concentrations detected above the respective PQL. Grey shaded cells are PQLs greater than DEQ SLV; Yellow shaded cells are detected concentrations that exceed DEQ SLVs.*

## Table 3 – Sample Analyses Soil and Groundwater

| | | | SOIL SAMPLE NUMBERS | | | | | | | | | | | | | GROUNDWATER SAMPLES | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| CHEMICALS | Soil SLV[1] | OCC RBC[2] | MW4-S-3[3] | MW4-S-6 | MW4-S-11 | B7-S-03 | B7-S-06 | B7-S-09 | B-8-4 | B-8-8 | B-8-12 | B9-S-03 | B9-S-06 | B9-S-09 | Ground water SLV[4] ug/l | MW-4 45-55 ug/l[5] | MW-5 40-50 ug/l | MW-6 45-55 ug/l |
| METALS-TOTAL (EPA 6010B/7471A) | mg/kg | mg/kg | | | | | | | | | | | | | | | | |
| Antimony | 64 | 410[a] | | | | | | | | | | | | | 6 | <5.6 | <5.6 | <5.6 |
| Arsenic | 7 | 1.7 | <13 | <14 | <12 | <13 | <13 | <13 | <13 | <13 | <14 | <12 | <13 | <14 | 0.045 | <3.3 | <3.3 | <3.3 |
| Beryllium | na | 2000 | | | | | | | | | | | | | na | <11 | <11 | <11 |
| Barium | na | >100x 10[3] | 170 | 190 | 130 | 250 | 180 | 150 | 270 | 170 | 150 | 180 | 260 | 180 | na | | | |
| Cadmium | 1 | 510 | <0.65 | <0.68 | <0.61 | <0.63 | <0.65 | <0.67 | <0.67 | <0.68 | <0.69 | <0.59 | <0.66 | <0.68 | 0.094 | <4.4 | <4.4 | <4.4 |
| Chromium (total) | 111 | 180 | 23 | 20 | 13 | 24 | 23 | 25 | 26 | 18 | 22 | 18 | 25 | 18 | 100 | <11 | <11 | <11 |
| Copper | 149 | 38000 | | | | | | | | | | | | | 2.7 | <11 | <11 | <11 |
| Lead | 17 | 800 | 9.6 | 12 | <6.1 | 61 | 12 | 10 | 14 | 15 | 12 | 67 | 17 | 12 | 0.54 | <1.1 | <1.1 | <1.1 |
| Mercury | 0.07 | 310 | <0.32 | <0.34 | <0.3 | <0.31 | <0.32 | <0.33 | <0.33 | <0.34 | <0.35 | <0.29 | <0.33 | <0.34 | 0.77 | <0.5 | <0.5 | <0.5 |
| Nickel | 48.6 | 20000 | | | | | | | | | | | | | 16 | <22 | <22 | <22 |
| Selenium | 2 | 5100 | <13 | <14 | <12 | <13 | <13 | <13 | <13 | <14 | <14 | <12 | <13 | <14 | 5 | <5.6 | <5.6 | <5.6 |
| Silver | 5 | 5100 | <0.65 | <0.68 | <0.61 | <0.63 | <0.65 | <0.67 | <0.67 | <0.68 | <0.69 | <0.59 | <0.66 | <0.68 | 0.12 | <11 | <11 | <11 |
| Thallium | na | 82[a] | | | | | | | | | | | | | na | <5.6 | <5.6 | <5.6 |
| Zinc | 459 | 310[a] | | | | | | | | | | | | | 36 | <28 | <28 | <28 |
| | | | | | | | | | | | | | | | | | | |
| METALS-DISSOLVED (EPA 200.8/7470A) | na | | | | | | | | | | | | | | | | | |
| Antimony | | | | | | | | | | | | | | | 6 | <5 | <5 | <5 |
| Arsenic | | | | | | | | | | | | | | | 0.045 | <3 | <3 | <3 |
| Beryllium | | | | | | | | | | | | | | | na | <10 | <10 | <10 |
| Barium | | | | | | | | | | | | | | | na | | | |
| Cadmium | | | | | | | | | | | | | | | 0.094 | <4 | <4 | <4 |

| CHEMICALS | Soil SLV[1] | OCC RBC[2] | MW4-S-3[3] | MW4-S-6 | MW4-S-11 | B7-S-03 | B7-S-06 | B7-S-09 | B-8-4 | B-8-8 | B-8-12 | B9-S-03 | B9-S-06 | B9-S-09 | Ground water SLV[4] ug/l | MW-4 45-55 ug/l[5] | MW-5 40-50 ug/l | MW-6 45-55 ug/l |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Chromium (total) | | | | | | | | | | | | | | | 100 | <10 | <10 | <10 |
| Copper | | | | | | | | | | | | | | | 2.7 | <10 | <10 | <10 |
| Lead | | | | | | | | | | | | | | | 0.54 | <1 | <1 | <1 |
| Mercury | | | | | | | | | | | | | | | 0.77 | <0.5 | <0.5 | <0.5 |
| Nickel | | | | | | | | | | | | | | | 16 | <20 | <20 | <20 |
| Selenium | | | | | | | | | | | | | | | 5 | <5 | <5 | <5 |
| Silver | | | | | | | | | | | | | | | 0.12 | <10 | <10 | <10 |
| Thallium | | | | | | | | | | | | | | | na | <5 | <5 | <5 |
| Zinc | | | | | | | | | | | | | | | 36 | <50 | <50 | <50 |
| | | | | | | | | | | | | | | | | | | |
| PCBs AROCLORS (EPA 8082) | ug/kg | ug/kg | | | | | | | | | | | | | | | | |
| Aroclor 1016 | 530 | 21000[a] | <65 | <68 | <61 | <63 | <65 | <67 | <67 | <68 | <69 | <59 | <66 | <68 | 0.96 | <0.047 | <0.047 | <0.047 |
| Aroclor 1221 | | 620[a] | <65 | <68 | <61 | <63 | <65 | <67 | <67 | <68 | <69 | <59 | <66 | <68 | 0.034 | <0.047 | <0.047 | <0.047 |
| Aroclor 1232 | | 620[a] | <65 | <68 | <61 | <63 | <65 | <67 | <67 | <68 | <69 | <59 | <66 | <68 | 0.034 | <0.047 | <0.047 | <0.047 |
| Aroclor 1242 | | 740[a] | <65 | <68 | <61 | <63 | <65 | <67 | <67 | <68 | <69 | <59 | <66 | <68 | 0.034 | <0.047 | <0.047 | <0.047 |
| Aroclor 1248 | 1500 | 740[a] | <65 | <68 | <61 | <63 | <65 | <67 | <67 | <68 | <69 | <59 | <66 | <68 | 0.034 | <0.047 | <0.047 | <0.047 |
| Aroclor 1254 | 300 | 740[a] | <65 | <68 | <61 | <63 | <65 | <67 | <67 | <68 | <69 | <59 | <66 | <68 | 0.033 | <0.047 | <0.047 | <0.047 |
| Aroclor 1260 | 200 | 740[a] | <65 | <68 | <61 | <63 | <65 | <67 | <67 | <68 | <69 | <59 | <66 | <68 | 0.034 | <0.047 | <0.047 | <0.047 |
| Aroclor 1262 | | | <65 | <68 | <61 | <63 | <65 | <67 | <67 | <68 | <69 | <59 | <66 | <68 | na | <0.047 | <0.047 | <0.047 |
| Aroclor 1268 | | | <65 | <68 | <61 | <63 | <65 | <67 | <67 | <68 | <69 | <59 | <66 | <68 | na | <0.047 | <0.047 | <0.047 |
| | | | | | | | | | | | | | | | | | | |
| ORGANOCHLORINE PESTICIDES (EPA 8081A) | ug/kg | | | | | | | | | | | | | | | | | |
| alpha-BHC | | | | | | | | | | | | | | | 0.0049 | <0.0047 | <0.0047 | <0.047 |
| beta-BHC | | | | | | | | | | | | | | | 0.017 | <0.0047 | <0.0047 | <0.047 |
| delta-BHC | | | | | | | | | | | | | | | 0.037 | <0.0047 | <0.0047 | <0.047 |

| CHEMICALS | Soil SLV[1] | OCC RBC[2] | MW4 -S-3[3] | MW4 -S-6 | MW4- S-11 | B7- S-03 | B7- S-06 | B7- S-09 | B-8- 4 | B-8- 8 | B-8- 12 | B9- S-03 | B9- S-06 | B9- S-09 | Ground water SLV[4] ug/l | MW-4 45-55 ug/l[5] | MW-5 40-50 ug/l | MW-6 45-55 ug/l |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| gamma-BHC (Lindane) | 4.99 | | | | | | | | | | | | | | 0.052 | <0.0047 | <0.0047 | <0.047 |
| Heptachlor | 10 | | | | | | | | | | | | | | 0.000079 | <0.0047 | <0.0047 | <0.047 |
| Aldrin | 40 | | | | | | | | | | | | | | 0.00005 | <0.0047 | <0.0047 | <0.047 |
| Heptachlor Expoxide | 16 | | | | | | | | | | | | | | 0.000039 | <0.0047 | <0.0047 | <0.047 |
| gamma-Chlordane | 0.37 | | | | | | | | | | | | | | 0.00081 | <0.0047 | <0.0047 | <0.047 |
| alpha-Chlordane | 0.37 | | | | | | | | | | | | | | 0.00081 | <0.0047 | <0.0047 | <0.047 |
| 4,4'-DDE | 0.33 | | | | | | | | | | | | | | 0.00022 | <0.0047 | <0.0047 | <0.047 |
| 4,4'-DDD | 0.33 | | | | | | | | | | | | | | 0.00031 | <0.0047 | <0.0047 | <0.047 |
| 4,4'-DDT | 0.33 | | | | | | | | | | | | | | 0.00022 | <0.0047 | <0.0047 | <0.047 |
| Dieldrin | 0.0081 | | | | | | | | | | | | | | 0.000054 | <0.0047 | <0.0047 | <0.047 |
| Endosulfan I | | | | | | | | | | | | | | | 0.051 | <0.0047 | <0.0047 | <0.047 |
| Endosulfan II | | | | | | | | | | | | | | | 0.051 | <0.0047 | <0.0047 | <0.047 |
| Endrin | 207 | | | | | | | | | | | | | | 0.036 | <0.0047 | <0.0047 | <0.047 |
| | | | | | | | | | | | | | | | | | | |
| Endrin Aldehyde | | | | | | | | | | | | | | | na | <0.0047 | <0.0047 | <0.047 |
| Methoxychlor | | | | | | | | | | | | | | | 0.03 | <0.0094 | <0.0094 | <0.0094 |
| Endosulfan Sulfate | | | | | | | | | | | | | | | 89 | <0.0047 | <0.0047 | <0.047 |
| Endrin Ketone | | | | | | | | | | | | | | | na | <0.019 | <0.019 | <0.019 |
| Toxaphene | | | | | | | | | | | | | | | 0.0002 | <0.047 | <0.047 | <0.047 |
| | | | | | | | | | | | | | | | | | | |
| VOLATILE ORGANIC CHEMICALS (EPA 8260B) | ug/kg | | | | | | | | | | | | | | | | | |
| 1,1,1,2-Tetrachloroethane | | | | | | | | | | | | | | | 2.5 | <0.2 | <0.2 | <0.2 |
| 1,1,1-Trichloroethane | | | | | | | | | | | | | | | 11 | <0.2 | <0.2 | <0.2 |
| | | | | | | | | | | | | | | | | | | |

| CHEMICALS | Soil SLV[1] | OCC RBC[2] | MW4 -S-3[3] | MW4 -S-6 | MW4- S-11 | B7- S-03 | B7- S-06 | B7- S-09 | B-8- 4 | B-8- 8 | B-8- 12 | B9- S-03 | B9- S-06 | B9- S-09 | Ground water SLV[4] ug/l | MW-4 45-55 ug/l[5] | MW-5 40-50 ug/l | MW-6 45-55 ug/l |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1,1,2,2-Tetrachoroethane | | | | | | | | | | | | | | | 0.33 | <0.2 | <0.2 | <0.2 |
| 1,1,2-Trichoroethane | | | | | | | | | | | | | | | 1.2 | <0.2 | <0.2 | <0.2 |
| 1,1-Dichloroethane | | | | | | | | | | | | | | | 47 | <0.2 | <0.2 | <0.2 |
| 1,1-Dichloroethene | | | | | | | | | | | | | | | na | <0.2 | <0.2 | <0.2 |
| 1,1-Dichloropropene | | | | | | | | | | | | | | | na | <0.2 | <0.2 | <0.2 |
| 1,2,3-Trichlorobenzene | | | | | | | | | | | | | | | na | <0.2 | <0.2 | <0.2 |
| 1,2,3-Trichloropropane | | | | | | | | | | | | | | | 0.0095 | <0.2 | <0.2 | <0.2 |
| 1,2,4-Trichlorobenzene | 9200 | | | | | | | | | | | | | | 8.2 | <0.2 | <0.2 | <0.2 |
| 1,2,4-Trimethylbenzene | | | | | | | | | | | | | | | na | <0.2 | <0.2 | <0.2 |
| 1,2-Dibromo-3-chloropropane | | | | | | | | | | | | | | | na | <1 | <1 | <1 |
| 1,2-Dibromoethane | | | | | | | | | | | | | | | 0.033 | <0.2 | <0.2 | <0.2 |
| 1,2-Dichlorobenzene | 1700 | | | | | | | | | | | | | | 49 | <0.2 | <0.2 | <0.2 |
| 1,2-Dichloroethane | | | | | | | | | | | | | | | 0.73 | <0.2 | <0.2 | <0.2 |
| 1,2-Dichloropropane | 300 | | | | | | | | | | | | | | 0.97 | <0.2 | <0.2 | <0.2 |
| 1,3,5-Trimethylbenzene | | | | | | | | | | | | | | | na | <0.2 | <0.2 | <0.2 |
| 1,3-Dichlorobenzene | | | | | | | | | | | | | | | 14 | <0.2 | <0.2 | <0.2 |
| 1,3-Dichloropropane | | | | | | | | | | | | | | | na | <0.2 | <0.2 | <0.2 |
| 1,4-Dichlorobenzene | 300 | | | | | | | | | | | | | | 2.8 | <0.2 | <0.2 | <0.2 |
| 2,2-Dichloropropane | | | | | | | | | | | | | | | na | <0.2 | <0.2 | <0.2 |
| 2-Butanone (Methyl Ethyl Ketone) | | | | | | | | | | | | | | | 7100 | <5 | <5 | <5 |

| CHEMICALS | Soil SLV[1] | OCC RBC[2] | MW4 -S-3[3] | MW4 -S-6 | MW4- S-11 | B7- S-03 | B7- S-06 | B7- S-09 | B-8- 4 | B-8- 8 | B-8- 12 | B9- S-03 | B9- S-06 | B9- S-09 | Ground water SLV[4] ug/l | MW-4 45-55 ug/l[5] | MW-5 40-50 ug/l | MW-6 45-55 ug/l |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 2-Chloroethyl Vinyl Ether | | | | | | | | | | | | | | | na | <1 | <1 | <1 |
| 2-Chlorotoluene | | | | | | | | | | | | | | | na | <0.2 | <0.2 | <0.2 |
| 2-Hexanone | | | | | | | | | | | | | | | 99 | <2 | <2 | <2 |
| 4-Chlorotoluene | | | | | | | | | | | | | | | na | <0.2 | <0.2 | <0.2 |
| Acetone | | | | | | | | | | | | | | | 1500 | <5 | <5 | <5 |
| Benzene | | | | | | | | | | | | | | | 1.2 | <0.2 | <0.2 | <0.2 |
| Bromobenzene | | | | | | | | | | | | | | | na | <0.2 | <0.2 | <0.2 |
| Bromochloromethane | | | | | | | | | | | | | | | na | <0.2 | <0.2 | <0.2 |
| Bromodichloromethane | | | | | | | | | | | | | | | 1.1 | <0.2 | <0.2 | <0.2 |
| Bromoform | | | | | | | | | | | | | | | 8.5 | <1 | <1 | <1 |
| Bromomethane | | | | | | | | | | | | | | | 8.7 | <0.2 | <0.2 | <0.2 |
| Carbon Disulfide | | | | | | | | | | | | | | | 0.92 | <0.2 | <0.2 | <0.2 |
| Carbon Tetrachloride | | | | | | | | | | | | | | | 0.51 | <0.2 | <0.2 | <0.2 |
| Chlorethane | | | | | | | | | | | | | | | 23 | <1 | <1 | <1 |
| Chlorobenzene | | | | | | | | | | | | | | | 50 | <0.2 | <0.2 | <0.2 |
| Chloroform | | | | | | | | | | | | | | | 0.17 | <0.2 | <0.2 | <0.2 |
| Chloromethane | | | | | | | | | | | | | | | 2.1 | <1 | <1 | <1 |
| cis-1,2-Dichloroethylene | | | | | | | | | | | | | | | 61 | <0.2 | <0.2 | <0.2 |
| cis-1,3-Dichloropropene | | | | | | | | | | | | | | | 0.055 | <0.2 | <0.2 | <0.2 |
| Dibromochloromethane | | | | | | | | | | | | | | | na | <0.2 | <0.2 | <0.2 |
| Dibromomethane | | | | | | | | | | | | | | | 61 | <0.2 | <0.2 | <0.2 |
| Dichlorodifluoromethane | | | | | | | | | | | | | | | 390 | <0.2 | <0.2 | <0.2 |
| Ethylbenzene | | | | | | | | | | | | | | | 7.3 | <0.2 | <0.2 | <0.2 |
| Hexachlorobenzene | 19 | | | | | | | | | | | | | | 0.00029 | | | |

| CHEMICALS | Soil SLV[1] | OCC RBC[2] | MW4 -S-3[3] | MW4 -S-6 | MW4- S-11 | B7- S-03 | B7- S-06 | B7- S-09 | B-8- 4 | B-8- 8 | B-8- 12 | B9- S-03 | B9- S-06 | B9- S-09 | Ground water SLV[4] ug/l | MW-4 45-55 ug/l[5] | MW-5 40-50 ug/l | MW-6 45-55 ug/l |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Hexachlorobutadiene | 600 | | | | | | | | | | | | | | 0.86 | <0.2 | <0.2 | <0.2 |
| Iodomethane (Methyl Iodide) | | | | | | | | | | | | | | | na | <1 | <1 | <1 |
| Isopropylbenzene | | | | | | | | | | | | | | | 660 | <0.2 | <0.2 | <0.2 |
| m,p-Xylene | | | | | | | | | | | | | | | 1.8 | <0.4 | <0.4 | <0.4 |
| Methylene Chloride | | | | | | | | | | | | | | | 8.9 | <1 | <1 | <1 |
| Methyt-Butyl Ether | | | | | | | | | | | | | | | 37 | <0.2 | <0.2 | <0.2 |
| Methyl Isobutyl Ketone | | | | | | | | | | | | | | | na | <0.2 | <0.2 | <0.2 |
| Naphthalene | | | | | | | | | | | | | | | 0.2 | <1 | <1 | <1 |
| n-Butylbenzene | | | | | | | | | | | | | | | na | <0.2 | <0.2 | <0.2 |
| n-Propylbenzene | | | | | | | | | | | | | | | na | <0.2 | <0.2 | <0.2 |
| o-Xylene | | | | | | | | | | | | | | | 13 | <0.2 | <0.2 | <0.2 |
| p-Isopropyltoluene | | | | | | | | | | | | | | | na | <0.2 | <0.2 | <0.2 |
| sec-Butylbenzene | | | | | | | | | | | | | | | na | <0.2 | <0.2 | <0.2 |
| Styrene | | | | | | | | | | | | | | | 100 | <0.2 | <0.2 | <0.2 |
| tert-Butylbenzene | | | | | | | | | | | | | | | na | <0.2 | <0.2 | <0.2 |
| Tetrachloroethene | 500 | | | | | | | | | | | | | | 0.12 | 0.3 | <0.2 | 0.21 |
| Toluene | | | | | | | | | | | | | | | 9.8 | <1 | <1 | <1 |
| trans-1,2-Dichloroethene | | | | | | | | | | | | | | | 110 | <0.2 | <0.2 | <0.2 |
| trans-1,3-Dichloropropene | | | | | | | | | | | | | | | 0.055 | <0.2 | <0.2 | <0.2 |
| Trichloroethene | 2100 | | | | | | | | | | | | | | 0.17 | <0.2 | <0.2 | <0.2 |
| Trichlorofluoromethane | | | | | | | | | | | | | | | 1300 | <0.2 | <0.2 | <0.2 |
| Vinyl Acetate | | | | | | | | | | | | | | | 16 | <2 | <2 | <2 |
| Vinyl Chloride | | | | | | | | | | | | | | | 0.015 | <0.2 | <0.2 | <0.2 |

| CHEMICALS | Soil SLV[1] | OCC RBC[2] | MW4 -S-3[3] | MW4 -S-6 | MW4- S-11 | B7- S-03 | B7- S-06 | B7- S-09 | B-8- 4 | B-8- 8 | B-8- 12 | B9- S-03 | B9- S-06 | B9- S-09 | Ground water SLV[4] ug/l | MW-4 45-55 ug/l[5] | MW-5 40-50 ug/l | MW-6 45-55 ug/l |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | | | | | | | | | | |
| POLYCYCLIC AROMATIC HYDROCARBONS (EPA 8270D/SIM) | ug/kg | ug/kg | | | | | | | | | | | | | | | | |
| Naphthalene | 561 | 22000 | <8.7 | <9.1 | <8.1 | 31 | <8.7 | <8.9 | <8.9 | <9 | <9.3 | <7.8 | <8.8 | <9 | 0.2 | <0.095 | <0.095 | <0.094 |
| 2-Methylnaphthalene | 200 | | <8.7 | <9.1 | <8.1 | 15 | <8.7 | <8.9 | <8.9 | <9 | <9.3 | <7.8 | <8.8 | <9 | 0.2 | <0.095 | <0.095 | <0.094 |
| 1-Methylnaphthalene | na | | <8.7 | <9.1 | <8.1 | 10 | <8.7 | <8.9 | <8.9 | <9 | <9.3 | <7.8 | <8.8 | <9 | na | <0.095 | <0.095 | <0.094 |
| Acenaphthylene | 200 | | <8.7 | <9.1 | <8.1 | 130 | <8.7 | <8.9 | <8.9 | <9 | <9.3 | <7.8 | <8.8 | <9 | 0.2 | <0.095 | <0.095 | <0.094 |
| Acenpththene | 300 | $41x10^6$ | <8.7 | <9.1 | <8.1 | <8.3 | <8.7 | <8.9 | <8.9 | <9 | <9.3 | <7.8 | <8.8 | <9 | 0.2 | <0.095 | <0.095 | <0.094 |
| Fluorene | 536 | $35x10^6$ | <8.7 | <9.1 | <8.1 | 16 | <8.7 | <8.9 | <8.9 | <9 | <9.3 | <7.8 | <8.8 | <9 | 0.2 | <0.095 | <0.095 | <0.094 |
| Phenanthrene | 1170 | | <8.7 | <9.1 | <8.1 | 260 | <8.7 | <8.9 | <8.9 | <9 | <9.3 | <7.8 | <8.8 | <9 | 0.2 | <0.095 | <0.095 | <0.094 |
| Anthracene | 845 | | <8.7 | <9.1 | <8.1 | 120 | <8.7 | <8.9 | <8.9 | <9 | <9.3 | <7.8 | <8.8 | <9 | 0.2 | <0.095 | <0.095 | <0.094 |
| Fluoranthene | 2230 | $29x10^6$ | <8.7 | <9.1 | <8.1 | 550 | <8.7 | <8.9 | <8.9 | <9 | <9.3 | 10 | <8.8 | <9 | 0.2 | <0.095 | <0.095 | <0.094 |
| Pyrene | 1520 | $21x10^6$ | <8.7 | <9.1 | <8.1 | 530 | <8.7 | <8.9 | <8.9 | <9 | <9.3 | 12 | <8.8 | <9 | 0.2 | <0.095 | <0.095 | <0.094 |
| Benzo(a)anthracene | 1050 | 2700 | <8.7 | <9.1 | <8.1 | 270 | <8.7 | <8.9 | <8.9 | <9 | <9.3 | <7.8 | <8.8 | <9 | 0.18 | <0.0095 | <0.0095 | <0.0094 |
| Chrysene | 1290 | 270000 | <8.7 | <9.1 | <8.1 | 480 | <8.7 | <8.9 | <8.9 | <9 | <9.3 | <7.8 | <8.8 | <9 | 0.18 | <0.0095 | <0.0095 | <0.0094 |
| Benzo(b)fluoranthene | | 2700 | <8.7 | <9.1 | <8.1 | 1400 | <8.7 | <8.9 | <8.9 | <9 | <9.3 | 9.1 | <8.8 | <9 | 0.018 | <0.0095 | <0.0095 | <0.0094 |
| Benzo(k)fluoranthene | 13000 | 27000 | <8.7 | <9.1 | <8.1 | 640 | <8.7 | <8.9 | <8.9 | <9 | <9.3 | <7.8 | <8.8 | <9 | 0.018 | <0.0095 | <0.0095 | <0.0094 |
| Benzo(a)pyrene | 1450 | 270 | <8.7 | <9.1 | <8.1 | 640 | <8.7 | <8.9 | <8.9 | <9 | <9.3 | 8.1 | <8.8 | <9 | 0.018 | <0.0095 | <0.0095 | <0.0094 |
| Ideno(1,2,3-c,d)pyrene | 100 | 2700 | <8.7 | <9.1 | <8.1 | 1600 | <8.7 | <8.9 | <8.9 | <9 | <9.3 | <7.8 | <8.8 | <9 | 0.018 | <0.0095 | <0.0095 | <0.0094 |
| Dibenz(a,h)anthracene | 1300 | 270 | <8.7 | <9.1 | <8.1 | 620 | <8.7 | <8.9 | <8.9 | <9 | <9.3 | <7.8 | <8.8 | <9 | 0.018 | <0.0095 | <0.0095 | <0.0094 |
| Benzo(g,h,i)perylene | 300 | | <8.7 | <9.1 | <8.1 | 2500 | <8.7 | <8.9 | <8.9 | <9 | <9.3 | <7.8 | <8.8 | <9 | 0.2 | <0.0095 | <0.0095 | <0.0094 |
| | | | | | | | | | | | | | | | | | | |

| CHEMICALS | Soil SLV[1] | OCC RBC[2] | MW4 -S-3[3] | MW4 -S-6 | MW4- S-11 | B7- S-03 | B7- S-06 | B7- S-09 | B-8- 4 | B-8- 8 | B-8- 12 | B9- S-03 | B9- S-06 | B9- S-09 | Ground water SLV[4] ug/l | MW-4 45-55 ug/l[5] | MW-5 40-50 ug/l | MW-6 45-55 ug/l |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | | | | | | | | | | |
| PETROLEUM HYDROCARBONS | ug/kg | | | | | | | | | | | | | | | | | |
| Diesel Range (NWTPH-Dx) | | | | | | <31x $10^3$ | | | | | | | | | | <250 | <250 | <250 |
| Lube Oil Range (NWTPH-Dx) | | | | | | <63 x$10^3$ | | | | | | | | | | <400 | <400 | <400 |
| Gasoline (NWTPH-HCID) | 22x$10^6$ | | | | | <25 x$10^3$ | | | | | | <24 x$10^3$ | | | | | | |
| Diesel Fuel (NWTPH-HCID) | 70x$10^6$ | | | | | <63 x$10^3$ | | | | | | <59 x$10^3$ | | | | | | |
| Lube Oil (NWTPH-HCID) | | | | | | <130 x$10^3$ | | | | | | <120 x$10^3$ | | | | | | |
| TPH-Gas (NWTPH-Gx) | | | | | | | | | | | | | | | | <100 | <100 | <100 |
| Oil & Grease (EPA 1664) | | | | | | | | | | | | | | | | <5200 | <5200 | <5200 |
| | | | | | | | | | | | | | | | | | | |

Notes:

*[1] Screening Level Values (SLVs) for soil from DEQ JSCS Table 3-1, DEQ preferred screening value highlighted orange on the table.*

*[2] DEQ Risk Based Concentrations (RBCs) for occupational exposure to soil, or if not available their EPA Regional Preliminary Remediation Goals (Sept 2008) for occupational worker noted by (e)*

*[3] Soil sample from boring for monitoring well; example MW4-S-3 is soil sample from MW4 boring taken from 3 feet depth below ground surface.*

*[4]Screening Level Values (SLVs) for water from DEQ JSCS Table 3-1, DEQ preferred screening value highlighted yellow on the table.*

*[5]Monitoring well number, with screened interval in feet depth below ground surface and detected values in ug/l.*

*Detected concentration below detection level (practical quantitation limit; PQL) noted as (<) with its respective PQL value.*

*Bolded values are concentrations detected above the respective PQL.*

*Grey shaded cells are PQLs greater than JSCS SLV.*

*Yellow shaded cells are detected concentrations that exceed JSCS screening level values.*

*Blank cells under screening criteria indicates no criteria available and under sample numbers indicates not analyzed.*

## Table 4
## Screening of Maximum Chemical Concentrations in Soil

| | | | DEQ Risk-Based Concentrations (RBCs) | | | | |
|---|---|---|---|---|---|---|---|
| **Chemical** | **Sample** | **Max Conc.** | **RBCss Occup.** | **RBCss Construct.** | **RBCss Excavation** | **RBCso Occup.** | **RBCsi Occup.** |
| **Concentration in mg/kg** | | | | | | | |
| Arsenic | MW4-S-6 | <14 | 1.7 | 13 | 370 | NV | NV |
| Barium | B7-S-03 | 250 | - | 62,000 | - | NV | NV |
| Chromium | B8-4 | 26 | 180 | 920 | 26,000 | NV | NV |
| Lead | B9-S-03 | 67 | 800 | 800 | 800 | NV | NV |
| **Concentration in µg/kg** | | | | | | | |
| Acenaphthylene | B7-S-03 | 130 | - | 19,000,000 | - | NV | NV |
| Anthracene | B7-S-03 | 120 | - | 93,000,000 | - | NV | NV |
| Benzo[a]anthracene | B7-S-03 | 270 | 2,700 | 21,000 | 590,000 | NV | NV |
| Benzo[b]fluoranthene | B7-S-03 | 1,400 | 2,700 | 21,000 | 590,000 | NV | NV |
| Benzo[k]fluoranthene | B7-S-03 | 640 | 27,000 | 210,000 | 5,900,00 | NV | NV |
| Benzo[g,h,i]perylene | B7-S-03 | 2,500 | - | - | - | NV | NV |
| Benzo[a]pyrene | B7-S-03 | 640 | **270** | 2,100 | 59,000 | NV | NV |
| Chrysene | B7-S-03 | 480 | 270,000 | 2,100,000 | 59,000,000 | NV | NV |
| Dibenz[a,h]anthracene | B7-S-03 | 620 | **270** | 2,100 | 59,000 | NV | NV |
| Fluoranthene | B7-S-03 | 550 | 29,000,000 | 8,900,000 | - | NV | NV |
| Fluorene | B7-S-03 | 16 | 41,000,000 | 12,000,000 | - | NV | NV |
| Indeno[1,2,3-c,d]pyrene | B7-S-03 | 1,600 | 2,700 | 21,000 | 590,000 | NV | NV |
| 1-Methylnaphthalene | B7-S-03 | 10 | - | - | - | NV | NV |
| 2-Methylnaphthalene | B7-S-03 | 15 | - | - | - | NV | NV |
| Naphthalene | B7-S-03 | 31 | 23,000 | 580,000 | 16,000,000 | 27,000 | 99,000 |
| Phenanthrene | B7-S-03 | 260 | - | - | - | NV | NV |
| Pyrene | B7-S-03 | 530 | 21,000,000 | 6,700,000 | - | NV | NV |

**Notes:**
Corrected from Table 1 of the November 2010 ICP Report.
RBCss = RBC for Soil Ingestion, Dermal Contact, and Inhalation Pathways
RBCso = RBC for Volatilization to Outdoor Air Pathway
RBCsi = RBC for Vapor Intrusion into Buildings Pathway.
Yellow shaded cells indicate maximum soil concentration exceeds RBC.
**Bold** values indicate RBCs that are exceeded.
NV = not volatile.

**Table 5**
**Screening of Maximum Chemical Concentrations in Groundwater**

| | | | DEQ Risk-Based Concentrations (RBCs) (µg/L) | | | DEQ |
|---|---|---|---|---|---|---|
| **Chemical** | **Sample** | **Max Conc. (µg/L)** | **RBCwo Occupational** | **RBCwi Occupational** | **RBCwe Excav.** | **SLV (µg/L)** |
| **Total Metals** | | | | | | |
| Arsenic | MW-4 | 6.2 | NV | NV | NV | 150 |
| Chromium | MW-4 | 24 | NV | NV | NV | **11** |
| Copper | MW-4 | 28 | NV | NV | NV | **9** |
| Lead | MW-4 | 9.7 | NV | NV | NV | **2.5** |
| Nickel | MW-4 | 25 | NV | NV | NV | 52 |
| Zinc | MW-4 | 160 | NV | NV | NV | **120** |
| Carbon Tetrachloride | MW-6 | 0.35 | 2,200 | 320 | 770 | 74 |
| Chloroform | MW-5 | 3.2 | 5,500 | 1,200 | 720 | 1,240 |
| o-Xylene | MW-6 | 0.22 | >S | >S | 23,000 | 13 |
| Tetrachloroethene | MW-4 | 0.3 | 9,200 | 1,400 | 240 | 840 |

**Notes:**
Corrected from Table 3 of the November 2010 ICP Report.
RBCwo = RBC for Volatilization to Outdoor Air Pathway
RBCwi = RBC for Vapor Intrusion into Buildings Pathway
RBCwe = RBC for Groundwater in Excavation Pathway.
SLV = DEQ ecological screening level value. SLV for xylene is for mixed xylenes.
Yellow shaded cells indicate maximum groundwater concentration exceeds screening level.
**Bold** values indicate screening values that are exceeded.
NV = not volatile
>S = screening level is greater than solubility limit